The numerical method to have any value must deal with a large number of cases, and all the agencies concerned in producing given results must have due weight. I have been fortunate in the number as well as the distinctive character of the cases set apart for investigation. I deal sparingly in dispensary and hospital cases, because they are followed with difficulty, and their statements cannot always be depended upon. As respects the character of the cases, they of course include all the forms of phthisis and all the stages. As respects the results of the treatment it will suffice to state now that all cases are not cured, but that the percentage of recoveries is surprisingly large.

Considerations in regard to the Administration of Atropia.—As the susceptibility to the action of this agent varies in different individuals, an inflexible rule as regards the dose cannot be made. I have usually administered about $\frac{1}{100}$th of a grain (five minims of a solution of one grain to the ounce of water) two or three times a day. As the effects of atropia are very persistent, usually two doses *per diem* will suffice to maintain a constant physiological action. If the quantity be so large as to produce great dryness of the mouth, retention of urine, and serious disturbances of vision, the patient may refuse to continue it. Moreover, large medicinal doses, although entirely safe, may cause irregular action of the heart. My observation is that the persistent daily use of moderate doses is preferable to the occasional administration of large doses. It suffices to cause moderate dilatation of the pupil, slight dryness of the mouth, and a little flushing of the cheeks.

When the cough is troublesome morphia may be combined with the atropia. When vomiting occurs strychnia may be given in the same prescription. When indicated, the alkaloïds, strychnia, atropia, and morphia may be dissolved in diluted muriatic acid instead of distilled water.

A serious difficulty frequently encountered in the treatment of phthisical subjects is a restless and hopeful disposition, which leads to frequent changes in the medical attendant, and to the trial of every new remedy. As in most cases, considerable time must elapse before any permanent improvement can be effected, it may happen that all the moral resources of the physician will be sorely tried to induce the patient to use the remedies in a proper manner and for a necessary period.

CINCINNATI, Ohio.

ART. XVIII.—*So-called "Second Sight" of Old People.* By SWAN M. BURNETT, M.D., of Washington, D. C.

LEGENDS of so-called "second sight," in persons advanced in years, are by no means uncommon, but I am not aware that any scientific examination of such a case has been placed upon record.

The following instance has been under my observation for the past two years, and its interest to optical science is sufficient, I think, to warrant its publication.

M. L. P., aged 85, began to use glasses for reading at about 40. He found it necessary to increase the strength of his glasses once subsequently. When about 70 he began to read his paper without the aid of spectacles, and has since that time been able to discard them altogether for reading even the finest print. He reads Jager 1 at 18 inches with ease. His distant vision is $\frac{20}{50}$ without the aid of glasses, but with $-\frac{1}{40}$ (-1 dioptric) it equals nearly $\frac{20}{20}$. Not all the letters of No. 20 of Snellen are made out, but all of No. 30 without trouble. He has now, and has had for some years, a slight conjunctivitis dependent upon an eversion of the *puncta lachrymalis* due to relaxation (senile) of the orbicularis.

Some years ago, about the time, he thinks, when he threw away his glasses, he suffered from subjective sensations of light in the form of coloured flashes, which persisted for some time; his eyes were also at that time sensitive to bright light and were somewhat injected.

The ophthalmoscope showed that lack of transparency in the lens which we always find in old people, but not in excess of what is commonly met with. This cloudiness was more intense in the centre of the lens. The details of the fundus presented nothing abnormal except here and there small dots of pigment.

The patient had a brother, who died at the advanced age of 93, who enjoyed his "second sight" for more than 20 years preceding his death.

Here we have, beyond question, a myopia that developed itself after the age of 70. The question now is as to the causes leading to its development.

That persons affected with incipient cataract may become myopic is well known. The subject was discussed at the meeting of the Heidelberg Ophthalmological Congress for 1873.[1] The discussion was participated in by Arlt, Wecker, Snellen, Ad. Weber, Förster, Meyer, and Horner. All of these gentlemen had seen myopia developed in those affected with incipient cataract. Weber had seen a $M = \frac{1}{5}$ developed in the course of two years, and in another case $M = \frac{1}{7}$ in the course of a few weeks. In both $V = \frac{12}{50}$. The lens in both instances showed a grayish-blue opacity of the nucleus with a grayish zone, diffuse and semi-transparent, of the corticalis. As to the cause of this increase of the static refraction of the lens, opinions were divided between an increase in the volume of the lens, and an increase in its index of refraction.

As regards the case just reported, we would not be warranted in calling it incipient cataract. Notwithstanding the conjunctival catarrh that was present, vision was almost $\frac{20}{20}$, which is even better than the acuteness of vision usually found in individuals of that age. Mr. Carter, in his late work on Diseases of the Eye, gives the acuteness of vision for 80 years as $\frac{11}{20}$. (Amer. ed., p. 60.) In Weber's cases, above quoted, V. was $\frac{12}{50}$. And besides, the length of time (15 years) that the M. has been in existence without any marked deterioration of vision precludes the idea of incipient cataract.

That hypermetropia may be developed in somewhat advanced life is now a generally accepted fact. In 1861, Jäger, Jr.,[2] wrote of it as follows:—

---

[1] Zehend. Monatsblat. 1873.

[2] Ueber die Einstellungen des dioptischen apparates im menschlichen Auges. Wien, p. 101.

"In many other cases in normally constructed eyes, and even in those of a weak myopic build, there is developed, in consequence of a rapidly developing sclerosis of the lens, and for that reason by preference in old people, in addition to a presbyopia [Fernsichtigkeit], also an hypermetropia [Ubersichtigkeit]."

"In this manner is produced, on the one hand, an increase of existing hypermetropia, and on the other hand, a decrease of any existing myopia."

"Some lenses show, under these circumstances, a considerable diminution in thickness; the lens substance shrivels, dries up as it were, through loss of its watery constituents, especially in the direction of its axis. In consequence of this, the surfaces, the anterior surface in particular . . . . lose their previous strong curvature."

Donders,[1] in speaking of the curves representing the positions of the near and far points of distinct vision at the various periods of life, says:—

"Up to the fortieth year it (the curve *r*) remains at the same height; but from that time an extremely slow descent occurs, the emmetropic becoming at the fiftieth year somewhat hypermetropic, which H. at the 80th year amounts to from $\frac{1}{24}$ to $\frac{1}{16}$. This acquired hypermetropia may, finally, become absolute, that is to say, that not only accommodation for diverging but even parallel rays becomes impossible."

It appears then that the static refraction of the eye does undergo a modification with age, and that it is due to senile changes in the lens, changes, however, which belong to the physiological evolution of the tissue. The nature of these changes appears to be, sclerosis or increase in the density of the lens-substance, and, in the case where hypermetropia is the result, an equalizing of the density of its substance and an increase in the radius of curvature of its surfaces. This latter appears to be the usual, natural, and, so to speak, the physiological course of these changes, but we know of no laws governing the process that make it necessary that it should invariably follow this course. There exists no reason why this increase of density of the lens-substance may not begin in the nucleus of the lens and remain confined more or less to that region. The effect of such a state evidently would be to increase the refractive power of the lens, since the greater the difference between the density of the nucleus and corticalis, the greater the index of refraction of the lens as a whole.

In this way we think the appearance of myopia in advanced years may be accounted for; and to be in keeping with the name Donders has given to the opposite state, it might be called *Myopia acquisita.*

But the *Myopia acquisita* may owe its origin to yet another cause. There may come about, from some cause, an elongation of the antero-posterior axis of the eyeball. Such a condition could be the result of a sclerotico-choroiditis as we have it in the myopia of younger years.

We may have, in other words, in *Myopia acquisita,* as in the myopia of earlier life, the producing cause either in an excess of refraction or in an elongation of the axis of the eye, and to differentiate the one from the other is by no means an easy matter, as has been clearly shown by Landolt.[2] In any case, it must be largely a matter of probability as to the one which plays the more important part. If we have a history which points to a *sclerotico-choroiditis posterior*, then we would be justified in concluding that we have a *Myopia axile* (Landolt); but if we have no such history it would be probable that the senile sclerosis of the lens, instead of following its usual course, and beginning in the corticalis, had started in the nucleus, and that the M. was due to excess of refraction. And, moreover, in any individual case it would not be unlikely that both causes might be in operation, the one augmenting the other, or that a *M. axile* would, to a greater or less extent, be counteracted by a hypermetropia from deficiency of refraction in the lens.

---

[1] Anomalies of Refrac. and Accom., p. 208.

[2] Ann. d'Oculist., t. lxxi. p. 49.

As regards our own case, it is probable that there was a sclerotico-choroiditis, the evidence of which lies in the subjective symptoms of flashes of light and slight photophobia, and in the objective appearances of the dots of pigment in the fundus, manifested ophthalmoscopically. And from this we would be inclined to regard it a case of *M. axile*, though the appearance of the lens is such as we would expect to find in a case where the sclerosis of the lens fibres had been most active at the nucleus.

The important fact, however, that we have learned from a study of the foregoing case is, that in the cases of "second sight" there is no essential rejuvenescence, as seems to be popularly believed. No power of accommodation is regained, but the far point of distinct vision, instead of being at infinity, is, through the development of the M., brought within the distance at which reading, writing, etc., are carried on, and thus glasses, which usually supply the place of accommodation in accomplishing this end, are able to be dispensed with.

November, 1876.

ART. XIX.—*Two New Instruments for Secondary Cataract Operation.* By GEO. STRAWBRIDGE, M.D., of Philadelphia. (With two wood-cuts).

ALL operations, as at present practised on secondary cataracts, practically have for their object, either the making of a large opening through the opaque membrane, or entirely removing it, without causing traction in the ciliary bodies (a fruitful source of inflammation.)

Such an opening can often be attained by simply puncturing the membrane with a cataract needle, or a Graefe or Baer cataract knife, but, as a rule, an opening so made is not sufficiently large, and can easily close, and so defeat the object. A more effectual way is found through the double needle operation of Bowman, but open to the objection of its being an operation difficult of performance.

The double hook operation, viz., dragging out a piece of membrane by two small blunt hooks through opposite corneal openings, and excising them, is certainly very effectual, but unfortunately very liable to involve the eyeball in destructive inflammation.

The extraction of the membrane, through a linear incision by a sharp hook or forceps, is also a dangerous proceeding, setting up perhaps severe irido-choroiditis.

In order to fulfil the above indication more completely than is done by the ordinary operation, and at the same time to avoid the serious consequence often following excision of the membrane, I have devised an instrument (see Figure 1), which consists of two needles, fitting closely on each other and having an *outer cutting* edge.